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Effect of Ion Clusters on Transport in Hydrated Block Copolymers

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Transport through hydrated membranes is important for a wide variety of applications including desalination, artificial photosynthesis, and hydrogen fuel cells. Model membranes for these applications can be created by self-assembly of block copolymers containing an ion-containing hydrophilic block and a nonionic hydrophobic block that provides the membrane with structural integrity in the hydrated state. The formation of ordered microdomains such as lamellae and cylinders in block copolymers is well-established. The ion-containing microdomains also contain nanoscale ionic aggregates. The talk will focus on the effect of morphology on transport of protons and hydroxide ions. We pay particular attention to the effect of clusters on ion transport.